REMARKS

Claims 1-32 have been canceled, and claims 33-64 have been added to this application, Thus, claims 33-64 are now pending in this case.

The specification also has been amended to make a number of corrections to the text and to provide an identifying number for the "seal surface" 31 in the drawings.

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Respectfully submitted,

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VERSION WITH MARKINGS TO SHOW CHANGES MADE

Changes to Specification

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wherein, the fluid-permeable face mask can demonstrate a negative pressure drop when air is passed into the filtering face mask with a velocity of at least [0.8] 8 m/s under a normal exhalation test.

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As shown in FIGs. 3 and 4, valve seat **26** has a seal ridge **30** that has a seal surface 31 to which the flexible flap **24** makes contact when a fluid is not passing through the valve **14**. An orifice **32** is located radially inward to seal ridge **30** and is circumscribed thereby. Orifice **32** can have cross-members **34** that stabilize seal ridge **30** and ultimately valve **14**. The cross-members **34** also can prevent flexible flap **24** from inverting into orifice **32** under reverse air flow, for example, during inhalation. When viewed from a side elevation, the surface of the cross-members **34** is slightly recessed beneath (but may be aligned with) seal [ridge **30**] surface 31 to ensure that the cross members do not lift the flexible flap **24** off seal [ridge **30**] surface 31 (see FIG. 3).

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Valve seat **26** preferably is made from a relatively light-weight plastic that is molded into an integral one-piece body. The valve seat can be made by injection molding techniques. The surface 31 of the seal ridge **30** that makes contact with the flexible flap **24** (the contact or seal surface) is preferably fashioned to be substantially uniformly smooth to ensure that a good seal occurs. The contact surface preferably has a width great enough to form a seal with the flexible flap **24** but is not so wide as to allow adhesive forces caused by condensed moisture to significantly make the flexible flap **24** more difficult to open. The width of the contact surface, preferably, is at least 0.2 mm, and preferably is in the range of about 0.25 mm to 0.5 mm.

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Exhalation valve **14** can be provided with a valve cover to protect the flexible flap **24**, and to help prevent the passage of contaminants through the exhalation valve. In FIG. [6] 7, a valve cover **50** is shown which can be secured to exhalation valve **14** by a friction fit to wall **44**. Valve cover **50** also can be secured to the exhalation valve **14** by ultrasonic welding, an adhesive, or other suitable means. Valve cover **50** has an opening **52** for the passage of a fluid. Opening **52** preferably is at least the size of orifice **32**, and preferably is larger than orifice **32**. The opening **52** is placed, preferably, on the valve cover **50** directly in the path of fluid flow **36** so that eddy currents are minimized. In this regard, opening **52** is approximately parallel to the path traced by the free end **38** of flexible flap **24** during its opening and closing. As with the flexible flap **24**, the valve cover opening **52** preferably directs fluid flow downwards so as to prevent the fogging of a wearer's eyewear. All of the exhaled air can be directed downwards by providing the valve cover with fluid-impermeable side walls **54**. Opening **52** can have cross-members **56** to provide structural support and aesthetics to valve cover **50**. A set of ribs **58** can be provided on valve cover **50** for further structural support and aesthetics. Valve cover **50** can have its interior fashioned such that there are female members (not shown) that mate with pins **41** of valve seat **14**. Valve cover **50** also can have a surface (not shown) that holds flexible flap **24** against flap-retaining surface **40**. Valve cover **50** preferably has fluid impermeable ceiling **60** that increases in height in the direction of the flexible flap from the fixed end to the free end. The interior of the ceiling **60** can be provided with a ribbed or coarse pattern or a release surface to prevent the free end of the flexible flap from adhering to the ceiling **60** when moisture is present on the ceiling or the flexible flap. The valve cover design **50** is fully shown in U.S. Design Patent Application 29/000,382. Another valve cover that also may be suitable for use on a face mask of this invention is shown in Design Patent Application 29/000,384. The disclosures of these applications are incorporated here by reference.

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The exhalation valve of Example 1 was mounted to a 3M 8810 filtering face mask such that the exhalation valve was positioned on the mask body directly opposite to where a wearer's mouth would be when the mask is worn. The airflow through the nozzle was increased to approximately 80 l/min to provide an airflow velocity of [0.9] 8.3 meters per second (m/s). At this velocity, zero pressure drop was achieved inside the face mask. An ordinary person will exhale at moderate to heavy work rates at an approximate air velocity of about [0.5 to 1.3] 5 to 13 m/s depending on the opening area of the mouth. Negative and relatively low pressures can be provided in a face mask of this invention over a large portion of this range of air velocity.

Examples	*Volume Flow (liters/minute)*	*Pressure Drop (Pa) Nozzle Area: [1.81 cm] 18.1 cm²*	*Pressure Drop (Pa) Nozzle Area: 2.26 cm²*	*Pressure Drop (Pa) Nozzle Area: 0.96 cm²*	*% Total Flow Nozzle Area: 18.1 cm²*	*% Total Flow Nozzle Area: 2.26 cm²*	*% Total Flow Nozzle Area: 0.95 cm²*
8	12	9.02	8.92	8.92	1	2	2
9	24	15.09	14.21	11.17	19	24	39
10	48	18.62	14.99	4.31	30	60	87
11	60	20.48	15.09	-1.76	56	68	102
12	72	22.34	14.80	-7.55	61	73	112
13	80	24.01	14.41	-12.94	62	77	119

Changes to the Abstract

[An exhalation valve **14** for a filtering face mask **10** has a flexible flap **24** that makes contact with a curved seal ridge **30** of a valve seat **26** when the valve **14** is in the closed position. The curvature of the seal ridge **30** corresponds to a deformation curve exhibited by the flexible flap **24** when secured as a cantilever at one end and exposed at its free portion to a uniform force and/or a force of at least the weight of the free portion of the flexible flap. A seal ridge curvature corresponding to a flexible flap exposed to uniform force allows the flexible flap **24** to exert a generally uniform pressure on the seal ridge to provide a good seal. A seal ridge curvature corresponding to a flexible flap exposed to a force of at least the weight of the flap's free portion allows the flexible flap **24** to be held in an abutting relationship to the seal ridge **30** under any static orientation by a minimum amount of force, thereby providing a face mask **10** with an extraordinary low pressure drop during an exhalation.]

A filtering face mask that comprises a mask body adapted to fit over the nose and mouth of a person; and an exhalation valve that is attached to the mask body. The exhalation valve comprises a valve seat and a flexible flap. The valve seat has an orifice through which fluid can pass and is surrounded by the seal surface. The flexible flap is operatively supported relative to the valve seat and pressed against the seal surface of the valve seat in a closed state of the exhalation valve. The flexible flap assumes in its closed state, a curved profile in a cross-sectional view thereof. The curved profile comprises a curve that extends from a first point where a first portion of the flexible flap contacts the seal surface to a second point where a second portion of the flexible flap contacts the seal surface. The flexible flap is held in its closed state, at least in part, by virtue of the curved profile thereof. The second portion of the flexible flap represents the only free portion of the flap and can flex so as to permit exhaled air to pass through the orifice and to provide an open state of the fluid flow valve such that the second portion of the flexible flap is out of contact with the seal surface at the second point while the first portion of the flexible flap is maintained in contact with the seal surface at the first point.